IS481/IS482

Low Voltage Operating and High Sensitivity Type OPIC Light Detectors

■ Features

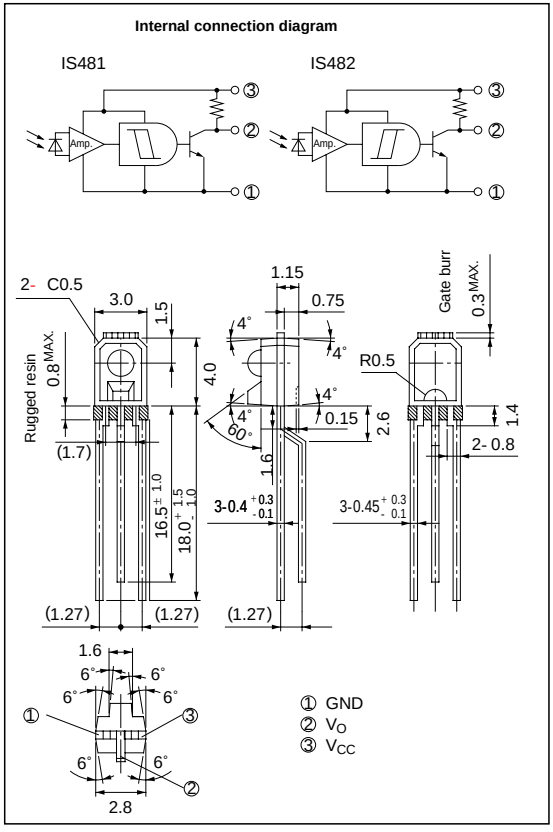
1. Built-in Schmidt trigger circuit
2. Low voltage operating type (V_{CC}:2.3to 7.0V)
3. High sensitivity type (**IS481** E_{VHL} : TYP. 5.4 lx at Ta=25 ˚C)
   (**IS482** E_{VLH} : TYP. 5.4 lx at Ta=25 ˚C)
4. LSTTL and TTL compatible
5. Low level output under incident light (**IS481**)
   High level output under incident light (**IS482**)

■ Applications

1. Battery-driven portable equipment

■ Outline Dimensions

(Unit : mm)

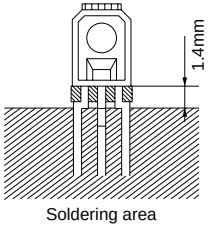


* OPIC (Optical IC) is a trademark of the SHARP Corporation. An OPIC consists of a light-detecting element and signal-processing circuit integrated onto a single chip.

■ Absolute Maximum Ratings

(Ta=25˚C)

Parameter	Symbol	Rating	Unit
Supply voltage	V_{CC}	-0.5 to +8	V
*1 Output current	Io	8	mA
*2 Total power dissipation	P	80	mW
Operating temperature	T_{opr}	-25 to +85	˚C
Storage temperature	T_{stg}	-40 to +100	˚C
*3 Soldering temperature	T_{sol}	260	˚C



*1 Output current vs. ambient temperature : Per Fig. 1
*2 Total power dissipation vs. ambient temperature : Per Fig. 2
*3 For 5 seconds at the position of 1.4 mm from bottom face of resin package

■ Electro-optical Characteristics

(Ta=0 to 70˚C, V_{CC} =5V unless otherwise specified)

Parameter			Symbol	Conditions	MIN.	TYP.	MAX.	Unit
Low level output voltage			V_{OL}	I_{OL}= 4mA,*4	-	0.15	0.4	V
High level output voltage			V_{OH}	*5	4.9	-	-	V
Low level supply current			I_{CCL}	*4	-	1.3	3.8	mA
High level supply current			I_{CCH}	*5	-	1.0	3.0	mA
*6 "High →Low" threshold illuminance		IS481	E_{VHL}	Ta= 25˚C	-	5.4	15	lx
					-	-	22	
		IS482		Ta= 25˚C	0.6	4.3	-	
					0.4	-	-	
*7 "Low→High" threshold illuminance		IS481	E_{VLH}	Ta= 25˚C	0.6	4.3	-	lx
					0.4	-	-	
		IS482		Ta= 25˚C	-	5.4	15	
					-	-	22	
*8 Hysteresis		IS481	E_{VLH} /E_{VHL}	Ta= 25˚C	0.55	0.80	0.95	-
		IS482	E_{VHL} /E_{VLH}					
Response time	"High→Low" propagation delay time	IS481	t_{PHL}	Ta= 25˚C Ev= 50 lx R_L= 1.2kΩ	-	3.0	15	µs
		IS482			-	9.0	30	
	"Low →High" propagation delay time	IS481	t_{PLH}		-	9.0	30	
		IS482			-	3.0	15	
	Rise time		t_r		-	0.1	0.5	
	Fall time		t_f		-	0.05	0.5	
Peak sensitivity wavelength			λ_P		-	900	-	nm

*4 Defines E_v =50 lx (**IS481**) and E_v =0 lx (**IS482**).

*5 Defines E_v =0 lx (**IS481**) and E_v =50 lx (**IS482**).

*6 E_{VHL} represents illuminance by CIE standard light source A (tungsten lamp) when output changes from "high" to "low".

*7 E_{VLH} represents illuminance by CIE standard light source A (tungsten lamp) when output changes from "low" to "high".

*8 Hysteresis standards for E_{VLH}/E_{VHL} (**IS481**) and E_{VHL}/E_{VLH}(**IS482**).

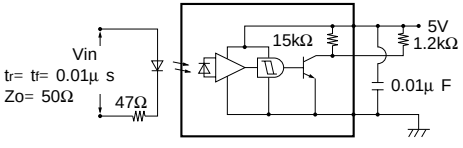
■ Recommended Operating Conditions

(Ta=0 to +70˚C)

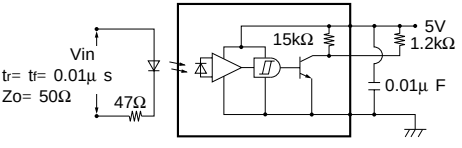
Parameter	Symbol	MIN.	MAX.	Unit
Supply voltage	V_{CC}	2.3	7.0	V
Output current	I_{OL}	-	4.0	mA

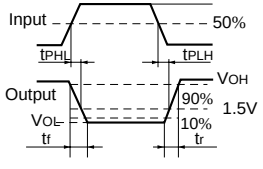
In order to stabilize power supply line, connect a by-pass capacitor of 0.01µ F or more between Vcc and GND near the device.

■ Test Circuit for Response Time (IS481)



■ Test Circuit for Response Time (IS482)





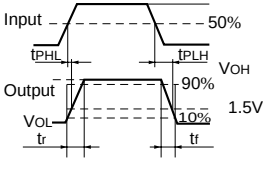


Fig. 1 Output Current vs. Ambient Temperature

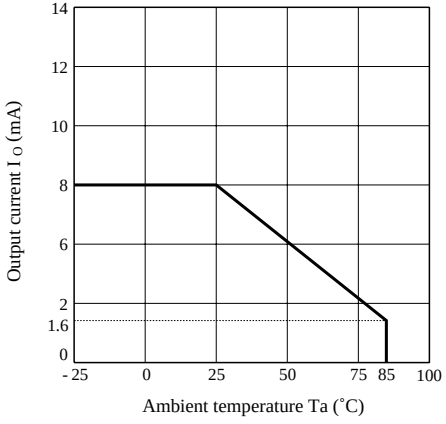


Fig. 2 Output Power Dissipation vs. Ambient Temperature

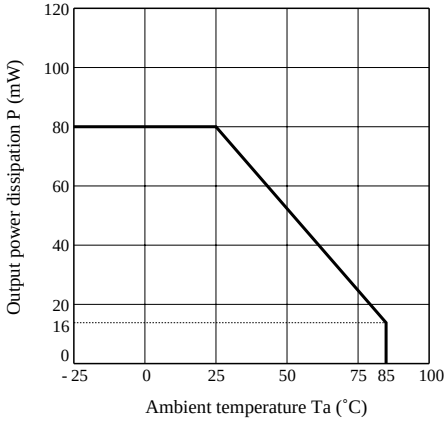


Fig. 3 Low Level Output Voltage vs. Low Level Output Current

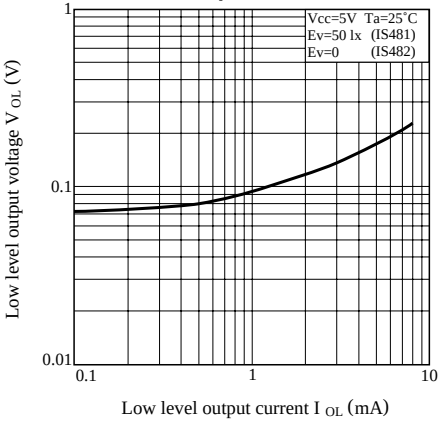


Fig. 4 Low Level Output Voltage vs. Ambient Temperature

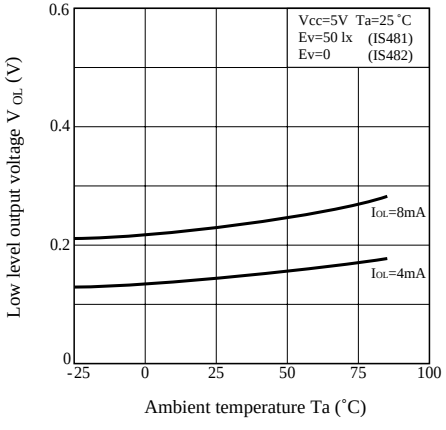


Fig. 5 Supply Current vs. Ambient Temperature

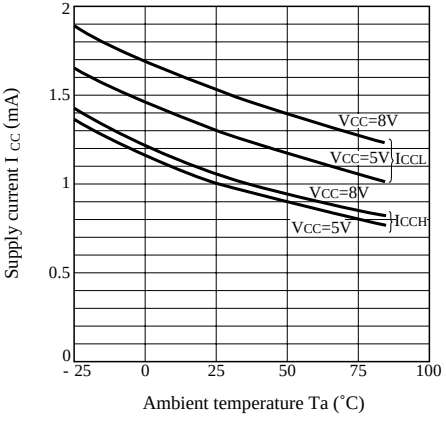


Fig. 6 Rise, Fall Time vs. Load Resistance

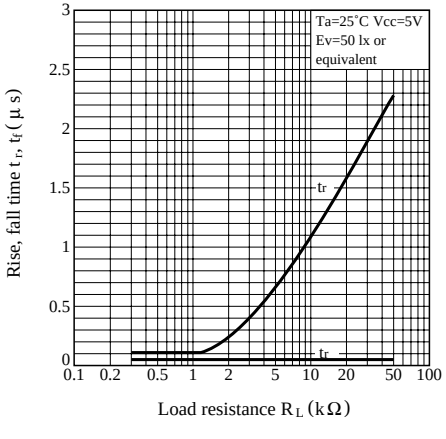


Fig. 7 Radiation Diagram (Ta=25 ˚C)

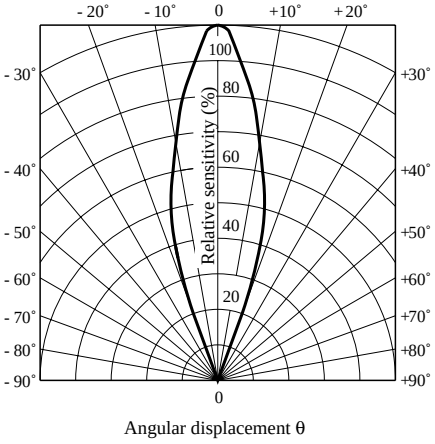
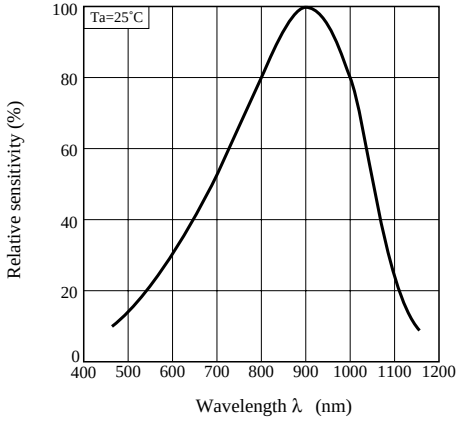


Fig. 8 Spectral Sensitivity (TYP.)



● Please refer to the chapter "Precautions for Use". (Page 78 to 93)